Capital Engineering and Manufacturing Company

Leak Test Procedure

Contract #: DAAE07-02-C-N137
Part Number: 11672113
Part Name: Tank, Fuel, Left Vehicular
CEMCO Job #: 8100

Leak Test Procedure #: 8100
Date: August 11, 2003
Procedure Rev.: 0

Apparatus Required

- Air Pressure Gauge mounted on a 2"-11-1/2 NPT Pipe Fitting.
- Shutoff Valve.
- Teflon Tape.
- Rubber Gasket, Cover Plate and Fittings as necessary.
- Soap Test Solution and Spray/Squirt Bottle Applicator.
- Tools as needed.

Fuel Tank Preparation

The fuel tank should be completely welded prior to leak testing. Grinding of welds other than for repair is prohibited. These are internal fuel tanks and therefore it is a critical requirement that these tanks do not leak. Welding of the unit subsequent to the leak test will require that the fuel tank is subject to another leak test. Position the fuel tank so that areas for leak test are readily accessible and visible while performing the leak test. The fuel tank may require repositioning to accomplish a thorough leak test.

Leak Detection

A leak can be detected by observing a pressure drop in the air pressure gauge. Leak locations can be detected on pressurized vessels by applying a soap test solution to the outside of the unit. The potential for leaks is greatest in areas that were sealed for the test, were seam or plug welded, on bend radii, and/or wherever repair welding and grinding has occurred. Apply the soap test solution to these areas and check for active soap bubbles. Basically, three types of leaks may be observed. A normal leak will cause the soap solution to bubble when applied. A slow leak will require that the soap solution sit for a period of time before the leak is observed. A fast leak may blow the soap solution away from the leak area so check for this condition by verifying that there is not a pressure drop at the air gauge after turning the shutoff valve to the closed position. Do not leak test with a soap solution until verifying that a rapid pressure drop is not occurring.

Leak Test Procedure

1. With the exception of Part Number 11672202, Half Coupling (8100-32), cover openings of the fuel tank with a plate and rubber gasket and tighten screws to prevent leakage.
2. Connect the air pressure gauge to Part Number 11672202, Half Coupling (8100-32) after application of Teflon tape to the pipe fitting.
3. The shutoff valve which is located between the air pressure gauge and air line can now be connected to the air line.
4. Slowly open the shutoff valve allowing air to be introduced into the fuel tank. Fill the fuel tank with 3-5 PSIG of air and turn off the shutoff valve.

5. Observe the air pressure gauge and look for a pressure drop. A pressure drop indicates leakage somewhere on the unit.
6. Apply the soap test solution to covered openings and fittings on the fuel tank and observe for leaks. Tighten and test as necessary to eliminate leaks at these locations.
7. Apply the soap test solution to areas that were welded, where there are bend radii, and/or wherever repair welding and grinding has occurred. Mark visible leaks as they are found with a crayon marker and annotate "1", "2", etc. Review areas where the soap test solution was previously applied and mark any slow leaks found. Verify that the pressure on the gauge is still within the acceptable test parameters.

Leak Test Results

1. ***No leaks observed*** –
    a. Observe the air pressure reading on the pressure gauge and let the unit sit under pressure for approximately 5 minutes. If the pressure does not drop, the unit is considered to have passed the leak test.
    b. Upon completion of the test disconnect the shutoff valve from the airline and slowly open the valve to release the air from the fuel tank.
    c. Remove fittings and covers from the fuel tank and mark the unit indicating that it has passed the leak test.
2. ***Leaks observed*** –
    a. Slowly open the valve to release the air from the fuel tank.
    b. Repair the leaks utilizing the parameters found in the approved Shop Welding Procedures making sure that all areas that leak are ground out before weld repair. No "dabbing" is permitted.
    c. Repeat the leak test as necessary until no leaks are observed.

Leak Test Report

1. Place a 3-digit S/N (i.e. "001", "002", etc.) near the area called out for the rubber die stamp.
2. Record all leaks by S/N of tank.